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Weather and the common cold; 28 day data

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Data are available from the College of General Practitioners of the incidence of the "Febrile Common Cold and influenza-like illnesses", over an 8 year period on a weekly basis, the population sample being about 150,000 potential patients, mostly in England and Northern Ireland.

Examination of 28 day means of disease incidence (rate per 100,000), showed a high correlation with illnesses reported during the 2 previous weeks. The mean over the 10 weeks previous to these 2 weeks was also considered.

Partial correlations were determined with respect to:-

Infection previous 2 weeks (infection factor)	+ 0.72
Infection previous 10 weeks in excess of 75 (immunity factor)	- 0.40

Using 60 sets of 28 day data, a double regression on these two independent variables gave a multiple correlation of 0.69. If the mean minimum temperature at Kew over the 4 week period starting 1 week earlier than the 4 week disease period was included the triple regression multiple correlation became 0.79. The inclusion of the second meteorological factor, namely the change in mean minimum from the previous 4 week period, increased the coefficient to 0.81, but inclusion of a mean vapour pressure factor had no significant effect.

The use of Kew data as typical of the whole medical sample area is not justified, nevertheless is excusable in a pilot study.

Formulae were established using the first 60 sets of data and tested on the remaining 39. The results were:-

Where:- C = Illness rate per 100,000; mean over 4 week period.

F = Infection factor, mean of C over previous 2 weeks.

M = Immunity factor, mean of C over 10 weeks previous to the 2 used in F, excess over 75.

N = Mean minimum at Kew over 4 week period starting 1 week previous to the disease data period.

ΔN = Change in N since previous period.

D = Greatest drop in minimum from one week to the next within the 4 week period.

Then $C = 92 + 0.425F - 0.3M - 6.3N - 4.45\Delta N$

with a multiple correlation of 0.81 over 60 data sets and 0.80 in the independent test over 39 sets.

or $C = 61 + 0.37F - 0.38M - 4.9N + 9.2D$

with a multiple correlation of 0.83 over 60 data sets and 0.77 in the independent test over 39 sets.

Considering only the independent variable F, M, and N, the partial correlations over the 60 data set were:

with	F	0.51
	M	-0.35
	N	-0.54

It is impossible to separate the effects of minimum temperature and vapour pressure (correction 0.96), but this preliminary analysis suggests that air minima could be used as a valid weather parameter.
In the calculation of N all minima over 12°C are counted as 12.

Any comments or suggestions on this paper should be referred to the author.

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